CASE STUDY - 10 Lifting/pushing/pulling	
TASK TITLE: Lifting/pushing/pulling	
Task Description:	**Lifting, pushing and pulling** may involve the use of a cart, items of varying weights and sizes (such as boxes of paper, stacks or paper or files) and placement of items at varying heights and locations (floor/shelves or a work surface). Typical jobs in which lifting/pushing/pulling is performed include (not necessarily limited to): • office supplies and distribution • copying and sorting • general administrative support
Job Performance Measures Most often impacted by Lifting/pushing/pulling:	Error rates, number of items retrieved and distributed
Typical Employee Comments about Lifting/pushing/pulling:	Employees typically complain about discomfort and/or stiffness in the back/torso, legs/feet, hands/wrists, arms, and shoulders/neck.
Suggested Level II Analysis:	Biomechanical Lifting Analysis, NIOSH Analysis.

Shoulder/Neck

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
1. Arms held away from body	• Rarely occurs	N/A					
2. Repeated reaching	• Pulling/pushing/lifting items that are too low (below knee level)	87. Raise work surface: • avoid lifting heavy items (e.g., boxes of copier paper) from floor level; • place heavy items on sturdy tables or shelves.	✓		low	low	med
		26. Locate heavy items between knuckle and elbow height: • middle shelves on a storage shelf should be reserved for the heaviest items; • provide tables or storage between knuckle and elbow height for heavy items.	✓		low	low	med
		25. Locate frequently retrieved items between knee and shoulder height.	✓		low	low	med

Shoulder/Neck

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
	• Pulling/pushing/lifting items that are too high. (above shoulder height) (see Figure 10.1)  **Figure 10.1**	29. Lower items below shoulder height: • minimize handling of heavy or bulky items to and from overhead shelves; • for example, avoid placing heavy binders that are used frequently in overhead storage. Place these items on the regular work surface or on a sturdy table or shelf.	✓		low	low	med
		26. Locate heavy items between knuckle and elbow height: • middle shelves on a storage shelf should be reserved for the heaviest items; • provide tables or storage between knuckle and elbow height for heavy items.	✓		low	low	med
		25. Locate frequently retrieved items between knee and shoulder height.	✓		low	low	med
		111. Use step stool to access high shelves.			low to med		

Shoulder/Neck

Job Factor	Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
	• Pulling/pushing/lifting items that are too far away from body	34. Move items closer to body: • for example, slide items closer to the edge of a table before lifting. 95. Train proper body mechanics/posture: • encourage person to keep the load as close to the body as possible while lifting/pushing/pulling; • move as close to the load as possible before lifting.	✓ ✓		low low	med low	med med
3. Shrugging: working with the shoulders shrugged	• Rarely occurs	N/A					
4. Repeated arm forces	• Repetitive handling of heavy items • Items require high forces to remove and replace (e.g., shelves or files that are overstuffed can cause high forces to place and remove items)	104. Use available cart to move boxes or files: • handle heavy items on carts. 95. Train proper body mechanics: • encourage person to avoid rushing while handling items; • allow adequate time to perform the task safely. 70. Provide adequate storage: • eliminate unnecessary items	✓ ✓ ✓		low low low to high	med low low	med med med

Shoulder/Neck

Job Factor	Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
		from storage in order to increase available space.					
		11. Group frequently used items together for convenient retrieval: • provide easy access for the most frequently used items by storing infrequently used items elsewhere.	✓		low	low	med
5. Holding/ carrying materials	• Carrying materials for long-distances. • Carrying heavy materials. • Carrying items in confined or tight spaces.	104. Use available cart to move boxes or files: • handle heavy items on carts; • provide appropriate sized carts for handling items in confined spaces.	✓		low	med	med
6. Cradling the telephone between the neck and shoulder	• Rarely occurs	N/A					
7. Head bent down, up, or neck twisted	• Rarely occurs	N/A					

Hands/Wrists/Arms

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
8. Bent Wrists	• Rarely occurs	N/A					
9. Repeated wrist movements	• Stocking shelves with items of various weights and sizes	95. Train proper body mechanics: • encourage person to maintain a straight wrist while handling items; • position body or item to improve wrist position while handling.	✓		low	low	med
10. Repeated finger movements	• Rarely occurs	N/A					
11. Hyper-extension of finger/thumb	• Rarely occurs	N/A					
12. Hand forces	• Repetitive handling of heavy items • Items require high forces to remove and replace. (e.g., shelves or files that are overstuffed can cause high forces to place and remove items) • Item is difficult to grasp and hold	104. Use available cart to move boxes, files etc.: • handle heavy items on carts. 95. Train proper body mechanics: • encourage person to avoid rushing while handling items; • allow adequate time to perform the task safely; • encourage person to use two hands to handle items whenever possible. 70. Provide adequate storage:	✓ ✓ ✓		low low low to	med low low	med med med

Hands/Wrists/Arms

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
		• eliminate unnecessary items from storage in order to increase available space; • provide easy access for the most frequently used items by storing infrequently used items elsewhere.			high		
		113. Use well fitting gripper gloves to pull files.	✓		low to med	low	med
13. Hard edges	• Hard edges on boxes or files	113. Use well fitting gripper gloves to pull files.	✓		low to med	low	med
14. Repeated forearm rotation	• Rarely occurs	N/A					

Back/Torso

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
15. Leaning forward/no back support	• Items positioned too low (below knuckle height)	87. Raise work surface: • avoid lifting heavy items (e.g., boxes of copier paper) from floor level; • place heavy items on sturdy tables or shelves.	✓		low	low	med
		26. Locate heavy items between knuckle and elbow height. • middle shelves on a storage shelf should be reserved for the heaviest items; • provide tables or storage between knuckle and elbow height for heavy items.	✓		low	low	med
		25. Locate frequently retrieved items between knee and shoulder height.	✓		low	low	med
		95. Train proper body mechanics: • encourage person to use the legs rather than the back to bend; • encourage person to arch the lower back while lifting.		✓	low	low	med

Back/Torso

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
16. Repeated bending	• Reaching for items too far from body (see Figure 10.2)  **Figure 10.2**	34. Move items closer to body: • for example, reduce or eliminate obstructions that prevent person from being closer to work.	✓		low	med to high	med
		95. Train proper body mechanics/posture: • encourage person to keep the load as close to the body as possible while lifting/ pushing/pulling; • move as close to the load as possible before lifting.	✓		low	low	med
17. Lifting forces	• Handling heavy items while bent and/or reaching for boxes, stacks or paper or files	26. Locate heavy items between knuckle and elbow height: • middle shelves on a storage shelf should be reserved for the heaviest items; • provide tables or storage between knuckle and elbow height for heavy items.	✓		low	low	med
		34. Move items closer to body: • for example, slide items closer to the edge of a table before lifting.	✓		low	med to high	med

Back/Torso

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
		104. Use available cart to move boxes, files etc.: • handle heavy items on carts; • provide appropriate sized carts for handling items in confined spaces.	✓		low	med	med
		95. Train proper body mechanics: • encourage person to avoid rushing while handling items; • allow adequate time to perform the task safely.	✓		low	low	med
18. No foot support	Rarely occurs	N/A					

Legs/Feet

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
19. Edge of seat or worksurface presses into legs	• Rarely occurs	N/A					
20. Hard floor surfaces	• Standing and walking on hard surfaces	110. Use proper footwear: • use shoes with comfortable, compressible soles; • provide an anti-fatigue mat for areas where persons stand for long periods of time.	✓		med	low	med
21. Kneeling/ squatting	• Rarely occurs	N/A					

Head/Eyes

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
22. Staring at screen or document	• Rarely occurs	N/A					
23 Glare	• Rarely occurs	N/A					
24. Light levels	• Rarely occurs	N/A					
25. Screen Distance	• Rarely occurs	N/A					
26. Difficult to read	• Rarely occurs	N/A					